

GLENN L. MARTIN COMPANY,

HAER No. CO-75-A

Titan Missile Test Facilities, Captive Test Stand D-1

Waterton Canyon Road and Colorado Highway 121

Vicinity of Lakewood

Jefferson County

Colorado

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30-LAKWD.V
2A-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Denver, Colorado 80225-0287

HISTORIC AMERICAN ENGINEERING RECORD

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Significance: By providing a facility where the Titan I and Titan II intercontinental ballistic missiles could be "flown on the ground" under controlled conditions prior to actual launch, Captive Test Stand D-1 played a key role in the development of the largest and most destructive weapons in the American nuclear deterrent force.

Description: Captive Test Stand D-1 is located in a saddle between two high knolls approximately 1.25 miles northwest of the Martin plant's main Administration Building. The test stand was designed around a pair of 25-foot wide, 38-foot high flame deflectors anchored to massive concrete foundations. Resembling truncated ski jumps, the deflectors have sloping, concrete-faced deflector panels supported by C-shaped, structural steel side frames. Stretched across the hillside behind the deflectors is a thick, reinforced counterfort that forms the outer wall for two large, bunker-like, equipment rooms. The rectangular equipment rooms are set into the slope and covered by a concrete slab. Two large, gabled, one-story, prefabricated steel support buildings stand adjacent to the slab. When the test stand was in use, a bridge-like steel work platform spanned the gap between the counterfort and the flame deflectors. Rising above the work platform were the two tilting, structural steel erector towers that positioned the missile stages for test firing. A tripodal tubular steel "umbilical tower" next to each flame deflector supported the electrical and propellant supply lines that sustained the missile during testing. Propellants were stored in large tanks near the test stand.

History: Test Stand D-1 was one of four identical captive firing facilities erected at Martin's Denver plant between 1957 and 1959. Designed by the Aerojet-General Corporation of Sacramento, California, the Denver facilities incorporated virtually every feature of the launch pads used for flight testing at Cape Canaveral. The test stands were built by the George A. Fuller Company, general contractor for the Martin plant. Steel components were fabricated by the Kaiser Steel Corporation.

Test Stand D-1 was the first captive firing facility to be activated at Martin-Denver, making its debut on 5 March 1958. Used almost exclusively for testing the Aerojet-General rocket engines before they were mated with the Martin-designed propellant feed system, Stand D-1 was equipped with a set of thick-walled, stainless-steel, fuel and oxidizer tanks, dubbed "battleship tanks." These heavily armored tanks enabled engineers to test the limits of the Titan propulsion system without having to worry about ruptured propellant tanks. Stand D-1 was extensively refitted in 1960-61 to accommodate the advanced Titan II missile. The first captive test of the new missile took place on this stand on 7 June 1961. The facility was deactivated in the mid-1960s, and the components of its steel superstructure were salvaged for scrap.

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HAER No. CO-75-A

Page 2

Sources: "First Titan ICBM Rocket Engine Test Fired Southwest of Denver," Rocky Mountain News, 6 March 1958. Other sources include original project blueprints located in the Plant Engineering Department at Martin-Marietta Astronautics Group, Denver, CO. The Company's Photographics Department maintains a large collection of black-and-white and color photographs depicting construction, equipment, and test activities at the stands during the period 1955-1960. The best published description of the test stands appeared in Russell Hawkes, "Hardened Titan Bases Require Specialized Support," Aviation Week 72 (18 January 1960): 66-67, 69, 71, 77-78, 81, 83. The conversion of the test stands for the Titan II is chronicled in "Test Stand Conversion Efforts Highlighting Test Area Activity," Martin Mercury 18 (11 November 1960): A; and "First Titan II Propulsion System Test Firing at M-D," Martin Mercury 18 (16 June 1961): O. The deactivation date is recorded in "Feb. 6, 1956-Feb. 6, 1966 -- Martin's First Decade in Denver," Martin News (11 February 1966): n.p.

Historians: John F. Lauber and Jeffrey A. Hess; Hess, Roise and Company, 1994.